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ABSTRACT

The author combined cost-benefit analysis with systems analysis, using the Optner model, to analyze the vocational education program in Danbury, Connecticut (a demonstration city), in 1969-70 and 1970-71. Background information on the community and the program's development are related; the analysis is presented in summary, illustrated by figures, tables, and computational exercises. The model conceptualizes the educational program as a productive system within a dynamic social systems framework. Dollar amounts were assigned to input and output phases: a return of $432,020 (earned by those students who became employed in an area related to their training during 1969-70) represents 124 percent of the input monies allocated for vocational education in Danbury during the same year, and represents the earnings of less than half the vocational education graduates for that year. Other findings were that the cost of vocational education decreased relative to the costs of educating students in the regular school program, and that the Optner model is a powerful analytical tool. The author concludes that the recent trend away from academic pursuit as a primary educational purpose has been a reaction to various dysfunctional societal symptoms, not a response to a vision of educators; their commitment could erase vocational education's stigma. (Author/AJ)

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An Analysis of Vocational Education in Danbury, Connecticut, 1969-70; An Application of Systems Analysis to Educational Programs, Allocations, and Benefits-- Emphasis on Danbury High School

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An Analysis of Vocational Education in Danbury, Connecticut, 1969-1970; An Application of Systems Analysis to Educational Programs, Allocations, and Benefits

(Emphasis on Danbury High School)

Respectfully submitted
for consideration to

Mr. Edward A. Sillari
Superintendent of Schools
Danbury Public School System
Danbury, Connecticut

by

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Table of Contents

	Page
List of Computational Exercises	iii
List of Figures	iii
List of Tables	iii
Introduction	1
Testimony and Implementation	5
Analysis	7
(In summary...)	18
Conclusion	22
Footnotes	25
Bibliography	27
(Articles and Periodicals)	27
(Books)	27
(Newspapers)	28
(Special Reports)	28
(Other)	28

Computational Exercises

Exercise — Page

Cost of Educating a Vocational Education Student
Danbury Public School System, 1969-1970 19

Cost of Educating a Vocational Education Student
Danbury Public School System, 1970-1971 20

Figures

Figure One: The Optner Model 9

Figure Two: The Optner Systems-Analysis Model as applied to Danbury's Vocational Education Program 10

Tables

Table One: Danbury High School Vocational Education Offerings, 1969-70 Total Student Involvement Statistical Followup Data 13

Table Two: Danbury High School Vocational Education Offerings, 1969-70 Statistical Followup Data (Derivative of Table One) 16

An Analysis of Vocational Education in Danbury, Connecticut, 1969-1970; An Application of Systems Analysis to Educational Programs, Allocations, and Benefits

Introduction

Nestled in the Berkshire Hills, approximately seventy miles north-east of Manhattan, is the city of Danbury, Connecticut. As with many other communities in the western portion of Connecticut, Danbury has been characterized recently by rapid population growth, a consequent expansion of housing units, and the recent influx of personnel into newly-constructed industrial parks. Danbury is a community in transition, representing the hub of a labor market area of over 400 square miles and boasting a regional population now in excess of 120,000. The fourteen small towns surrounding Danbury proper are rapidly becoming mini-suburbs, just as with improved transportation routes Danbury may well itself become a suburban segment of the ever-burgeoning New York City megalopolis.

As population has increased, so the problems of the Danbury Public School System have complexified. Heterogeneity of school clientele has forced the realization that sound, predictive educational planning is an imperative, and the Danbury Board of Education has sought by policy to not only react to change, but to sense trends and to determine rational bases for future action.

Early in the 1960's, Danbury was selected by the Connecticut State Department of Education as a Demonstration City. As a consequence of this selection, the various agencies of government in Danbury, including the Board of Education, mobilized in a concerted and com-

prehensive effort to analyze Danbury's potentialities, assets, capacities, and needs. Part of this analysis focused on the concept of Vocational Education as it might pertain to an expansion of educational program in the Danbury Public School System, and in 1964, the Board of Education, in cooperation with the Vocational Division of the Connecticut State Department of Education, commissioned two Vocational-Technical Education consultants--Albert E. Jochen and C. Thomas Olivo--to study the vocational characteristics of the region and to make recommendations. The final document, now known in the Danbury area as the "Jochen and Olivo Report," projected programs designed to meet the needs of youth, adults, and industry, and was titled--quite appropriately--Educated Manpower...Hope of the Present: Promise of the Future!

On the basis of responses by students, out-of-school youths, young employees, parents, and employers, and after a thorough analysis of the Danbury Labor Market Area, Jochen and Olivo drew five general conclusions: 1. Most of the employers in the area were enthusiastic about developing people interested in and having the capacity to profit from programs of vocational and technical education; 2. There was a perceived need for more vocational and technical education for all employment levels; 3. There needed to be continuous study of skill and content requirements of occupations in order to determine the exact nature of education and training; 4. The potential of youth required to develop fundamental and semi-specialized skills had been underestimated; and, 5. There was a growing recognition that all in business and industry had a cooperative responsibility

in working to identify the needs of not only youth, but of adults as well--with the purpose of developing an educational program which contained as an inseparable part Vocational Education.[1]

In addition to these general conclusions, Jochen and Olivo cited several observations which were to serve as the basic framework for recommendations regarding an action program of Vocational Education in Danbury. Some of the more salient of these observations were:

> *There is a need in Danbury and the entire labor market area for a well-organized vocational and technical education program. There is a large enough number of students, both youth and adults, who need, are interested in and may profit by such education and training. Such a program can be offered in Danbury with the cooperation of the Danbury High School....
> *Present offerings of approved vocational and technical education programs are provided at...two regional schools and a limited program of distributive education [exists] at...Danbury High School. The curriculum offerings at Danbury High School...are college preparatory with non-vocational offerings in business, home economics and industrial arts education as part of general education.
> *The increasing numbers of students who enter the secondary and post-secondary schools will increase the annual number of high school graduates seeking employment. While the training programs offered by business, trade organizations and industries will provide some on-the-job training, only limited numbers will have such opportunities....
> *The Danbury Labor Market Area is made up of small and medium-sized employers. A majority of the area business and industrial firms employing the greatest number of workers have expressed interest in and favor...a quality local and area vocational and technical education program....
> *The desire for vocational and technical education programs by high school students, early-school leavers, graduates, young employees and adults was expressed by in-school and out-of-school youth and adults and the parents who concurred with the student's (sic) occupational choices....[2]

Since the main focus will be primarily on Vocational Education as it relates to the Danbury Public Schools, only those specific recommendations pertaining to Danbury High School--presently the sole

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location of vocational education offerings within the public school system will have be of import and concern. It has been cited that operational in Danbury High School prior to the Jochen and Olivo study was an approved Distributive Education Program. Such a program seeks to develop in students "skills and technical knowledge associated with the marketing and merchandising of goods and services."[3] It was recommended in the study that Distributive Education not only be continued in Danbury High, but that continuous evaluation of the program be conducted in order to determine future growth trends and relevancy of course outlines and instructional materials.[4]

Jochen and Olivo also recommended the institution of three substantive vocational education programs at the high school:[5] 1. Vocational Business Education--designed to prepare pupils for employment as secretaries, stenographers, and to impart computational skills; 2. Occupational Home Economics--for students interested in hotel and motel employment or work in day-care and nursery settings, textile industries, or product-testing laboratories; and, 3. Vocational, Industrial and Technical Education. This third program encompassed six specific occupational programs:

1. Machine and metal industries occupations
2. Automotive industries occupations
3. Electrical/electronics industries occupations
4. Health industries occupations
5. Food industries occupations
6. Personal and general trade and industrial occupations.[6]

Projected also was a cooperative work experience program which would permit part-time high school student employment--supervised by both the employer and certificated Danbury School System personnel. Thus,

Vocational Education was recommended to the Danbury Public School System as a necessary and viable component of the total educational program; diversity in program was advocated, and Danbury sought to respond to the changing nature of reality.

Testimony and Implementation

Not only Jochen and Olivo were proponents of the concept of Vocational Education. Just prior to the study, the 88th Congress had appropriated $60,000,000 for vocational education; for the fiscal year ending June 30,1965, the appropriation was to be $118,500,000; for 1966--$177,500,000; and for the fiscal year ending June 30, 1967 and each fiscal year thereafter, the appropriation was to be $225,000,000.[7] Public Law 88-210, The Vocational Education Act of 1963, bore this express intent (Sec. I):

> ...to authorize Federal grants to States to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to develop part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis....[8]

Various authorities in the fields of education, industry, and government had also advocated Vocational Education. John Fisher, President of Teachers College, Columbia University, had said in the keynote address to a conference on Vocational Education:

> There is a growing concern in Teachers College about our response to one of the great challenges of this period: how (sic) people might most fittingly be prepared as producers, managers, and workers to carry their share in the economic life of the world....
> ...[Since] the rapidity of change in job requirements and employment patterns now suggests that the most essential of all work skills is the ability to learn, we must ask whether we are giving the attention we should to the develop-

ment of that ability as an object of particular study.
Or we may ask what the school's responsibility is when unemployment of the uneducated appears to be accepted as a chronic condition of the economy.[9]

Grant Venn, writing in Man, Education and Work, had pointed out the awesome importance of occupations to the individual: "A man's occupation in American society is now his single most significant status-conferring role. Whether it be high or low, a job status allows the individual to form some stable conception of himself and his position in the community."[10] Robert R. DeCarlo, Director of Automation Research for the IBM Corporation, in addition to echoing Venn's concerns and statements, had further suggested that career counseling be strengthened in view of the psychological consequences of the job-career decision.[11]

Common to all authorities seemed to be a commitment to the definition of Vocational Education stipulated in Section 8 of Public Law 88-210:

> The term "vocational education" means vocational or technical training or retraining which is given in schools or classes (including field or laboratory work incidental thereto) under public supervision and control or under contract with a State board or local educational agency, and is conducted as part of a program designed to fit individuals for gainful employment as semi-skilled or skilled workers or technicians in recognized occupations ...including any program designed to fit individuals for gainful employment in business and office occupations....[12]

With internalization of the need for vocational offerings at Danbury High School, and determined to implement the recommendations of the "Jochen and Olivo Report," the Danbury Public School System embraced the definition of Vocational Education and sought public finds for the construction of an adjunct facility to the

high school--one which would serve to house the proposed automobile servicing and machine operation programs. Locally-raised funds were returned by the State, and a building representing a commitment of $250,000--$150,000 for the actual facility and $100,000 for necessary equipment--was constructed. In addition, the distributive education program was studied with a view towards improvement and possible expansion. Health education programs, along with programs in electro-mechanical inspection and diversified work experience, were instituted. Further, business and office education was redesigned so as to be more vocational in nature. Danbury, therefore, planned a specific program of Vocational Education having seven components: Automobile servicing, machine operation, business and office education, health education, distributive education, electro-mechanical inspection, and diversified work experience.

Analysis

Vocational Education, having been purposely designed to facilitate the achievement of one paramount goal: "To provide students the opportunity to develop skills which will enable them to gain employment,"[13] lends itself most definitely to examination utilizing the notion of PPBS--Planning, Programming, Budgeting Systems. As a specific, discreet program, Vocational Education might also be scrutinized by the application of systems-analysis. One of the major difficulties with PPBS is the absolute fact that there exists a symbiotic relationship between educational programs,[14] and that the assigning of specific effects to one program may repre-

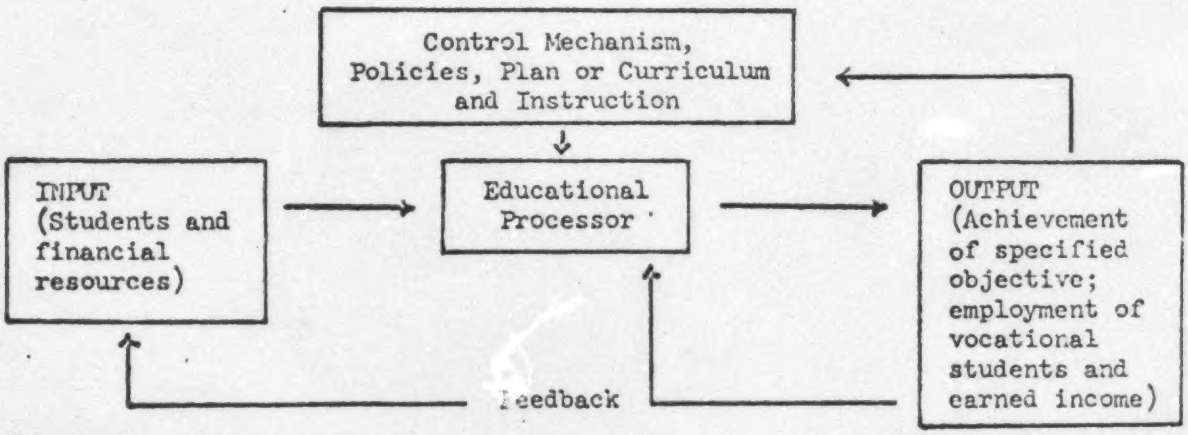
sent a fallacious assumption in terms of causality. When considered as a "system," however, the Program of Vocational Education may be conceptualized as a "process," whereby certain predetermined outputs are expected as the result of various resource-inputs. Given that resources are allocated and committed to Vocational Education, and that distinct programs as part of an encompassing process are instituted, it seems rather elementary to assume that output measures, especially in terms of student-employability and employment, might be ascertained. To the extent that employability of students is facilitated by vocational training, and to the extent that benefits to the community as a result of that employability surpass the level of resource-inputs allocated to the vocational-process, is the extent to which Vocational Education may be construed as "effective," and therefore successful, or "ineffective," and therefore, unsuccessful.

J. Alan Thomas would hold that by utilizing such a mode of thinking--using resources of a monetary nature as inputs, and seeking to determine benefits of a monetary nature as outputs--one was actually performing a "cost-benefit analysis" rather than a "cost-effectiveness analysis."[15] Such is entirely the case here. "The distinction between cost-benefit and cost-effectiveness analysis is essentially that for cost-benefit analysis there must be some way of translating benefits as well as costs into monetary terms."[16] If one analyzes dollar cost by dollar benefit, then one is performing a "simple cost-benefit analysis."[17] Thomas asserts that such analyses are appropriate for the study of Vocational Education benefits:

> Investments in job-related programs, such as vocational education or manpower training programs should be

> determined in part by the present value of streams of income and cost resulting from these programs.[18]
>
> State departments of education which are evaluating the results of their vocational education programs must be concerned with the ability of graduates to obtain gainful employment. It is, therefore, appropriate that states carry out cost-benefit analysis of their vocational educational programs.[19]

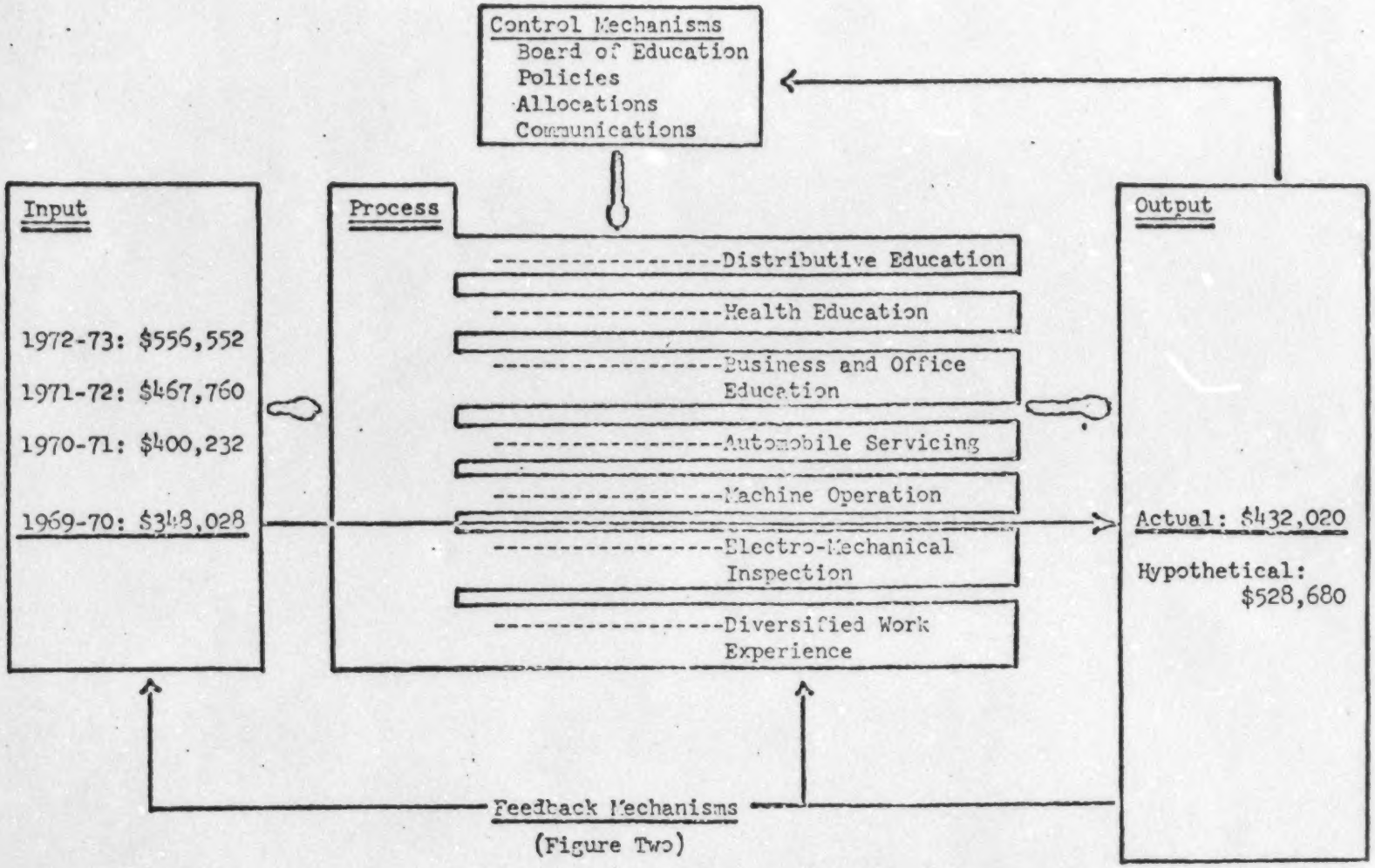
In combining cost-benefit analysis with systems-analysis, use was made of the Optner Model.[20] This model, or paradigm, permits one to conceptualize the school or educational program as a processing unit within a dynamic social systems framework. Although basically an engineering systems model, Optner's conceptualization aids one in comprehending the school or program unit as a productive system. The Optner paradigm is patterned as follows:


Control Mechanism, Policies, Plan or Curriculum and Instruction
INPUT (Students and financial resources)
Educational Processor
OUTPUT (Achievement of specified objective; employment of vocational students and earned income)
Feedback

(Figure One)

Although the Optner model served as the framework guiding this analysis, the model depicted in Figure Two, page 10, represents the actual model as it developed during the analysis. As may be observed, dollar amounts have been assigned to both input and output phases. In addition, the processing unit has been characterized as

The Optner Systems-Analysis Model
as applied to
Danbury's Vocational Education Program



(Figure Two)

a composite of seven distinct yet inter-related component programs.

In performing this analysis, a number of questions were asked. First, it was wondered whether or not there was sufficient information available to permit a dollar comparison of input and output levels. It was found that figures relative to input were available for the years 1970-1972, and that projected need figures had been determined for the school year 1972-1973. It was also found that the latest figures of an output nature available were for the 1969-1970 school year. Consequently, an input amount for the school year 1969-1970 had to be computed. This was done in the following manner: According to documents submitted to the Associate Commissioner for Vocational Education in the State of Connecticut by officials of the Danbury Public School System, the amount requested for Vocational Education Programs at Danbury High School, 1972-1973, was $556,552. This represented an increase over the prior year's allocation--$467,760--of approximately 19%. $467,760 had represented an increase of approximately 17% over the allocations for the school year 1970-1971, which had amounted to $400,232. Assuming that allocations do not always follow a rational pattern, but that some degree of uniformity relative to Vocational Education allocations to the Danbury Public School System did exist, it was thought that the figure of $400,232 would most likely represent an increase of 15% over the previous, or 1969-1970, year's allocation. Consequently, it was deduced that monies in the amount of $348,028 could be expected to be representative of actual figures for that year. Using this figure as a base, a number of questions were then posited rela-

tive to output data. These data, available from only one source--Statistical Data on Connecticut Students Completing Vocational Programs in 1970: Graduate Follow Up[21]--are summarized as they relate to the Vocational Process at Danbury High School in Table One on page 13. Table One presents data on each of the vocational programs operative in 1969-1970, and demonstrates immediately that those students who were unemployed after having completed vocational training during that year represented less than 2½% of the total number of students graduating. According to such data, one might conclude that the goal of Vocational Education was in fact being achieved. However, part of this analysis was held to be of a cost-benefit nature--hence, demanding data not presented in Table One.

Using the input figure of $348,028 as representing those resources necessary and responsible for the Vocational Process, answers were sought relative to the output, in terms of dollars, of that process. As may be seen by an examination of Table One, not all students graduating from the Vocational Process were available for employment in their areas of training. In fact, only about one-half, or 109 out of 227 students graduating, did enter occupations related to their vocational training. The bulk of the remainder chose to further their schooling on a full-time basis or to enter the armed forces. In order to be as scrupulous and as critical as possible, it was therefore decided to compute dollar output amounts--as indicative of economic benefits to Danbury--based only upon data relative to those 109 students, and, to

Danbury High School
Vocational Education Offerings, 1969-70
Total Student Involvement
Statistical Followup Data

OFFERINGS	Total Graduates	Armed Forces	Continued School f/t	Status Unknown	Other	Available for employment	IN OCCUPATION			Unrelated Occupation	p/t employment	Unemployed
							#	%	Hourly Wage			
Distributive Education	29	2	10	0	1	16	13	81	1.91	2	1	0
Health Education	12	0	5	0	1	6	5	83	1.90	1	0	0
Business and Office Education	114	6	34	9	7	58	40	69	1.90	15	0	3
Automobile Servicing	26	3	6	0	0	17	16	94	2.10	0	0	1
Machine Operation	20	2	5	0	0	13	11	85	2.20	1	0	1
Electro-Mechanical Inspection	7	1	0	0	0	6	6	100	2.13	0	0	0
Diversified Work Experience	19	1	0	0	0	18	18	100	1.95	0	0	0
SCHOOL TOTAL	227	15	60	9	9	134	109	81	1.98	19	1	5

(Table One)

seek to determine whether or not the earnings generated by those students surpassed the resource-input amount of $348,028.

Specifically, answers were sought to the following questions:

1. What was the amount of money actually earned by vocational education students who, upon graduation, entered into employment related to their specific areas of training?

2. What was the amount of money earned by students in each of the seven programs comprising the Danbury High School Vocational Process?

3. Had all students been available for employment-- assuming that employment opportunities existed-- how much would have been the hypothetical amount of return to the Danbury economy as a result of these students' earnings?

4. What was the total earning power of Vocational Education graduates from Danbury High School, 1969-1970?

5. How did the actual amount of dollar output compare with the input amount of $348,028?

6. What was the cost of educating a Vocational Education student in Danbury?

7. Was the cost of educating a vocational Education student in Danbury in line with that cost cited by authorities as indicative of exemplary programs?

In order to find answers to the above questions, it was necessary to examine the four columns outlined in Table One concerning the number of students available for employment, the number of students who actually became employed in the occupation for which they were trained, the percentage of those available who were actually employed, and the hourly wage rate for students in each program-component of the Vocational Process. These four columns

were used to compute and generate the figures which constitute Table Two on page 16--Vocational Education Offerings, 1969-70.

As may be seen, of 16 students available for employment after having trained in the distributive education program, thirteen actually took positions in the area of their training in 1969-1970. These students made a wage of $1.91 per hour. Consequently, for a forty-hour week, they could have been expected to generate $76.40 in earnings, and for a fifty-week year, their individual earnings could have been expected to approximate $3820.00. Personal income per capita in Connecticut for 1968-1969 was $4303.00.[22] Although students trained in this area did not surpass this figure according to first-year earnings, students in one area--machine operations--did, and students in two other areas--automobile servicing and electro-mechanical inspection--closely approximated the personal income per capita amount.

Taken collectively, the thirteen students trained in distributive education could have been expected to earn $993.20 per week. Thus, for a fifty-week year, they might generate as much as $49,660. Had all students available for employment in the area actually been employed in the area of retail distribution, the sum generated by their earnings would have totaled $61,120.

Following the same logic in regards to the other programs of the Vocational Process, it may be observed that in answer to the first question posited above, the actual amount of earnings of those students available for employment after having trained in

Danbury High School
Vocational Education Offerings, 1969-70
Statistical Followup Data

OFFERINGS	No. of students available for employment	Taking positions in occupations for which trained	Percentage of total	Wage per hour	Weekly wage	Individual yearly wage	Total weekly wage	Total yearly wage	Hypothetical total yearly return
Distributive Education	16	13	81	1.91	76.40	$3820	993.20	49,660	61,120
Health Occupations	6	5	83	1.90	76.00	$3800	380.00	19,000	22,800
Business and Office Education	58	40	69	1.90	76.00	$3800	3040	152,000	220,400
Automobile Servicing	17	16	94	2.10	84.00	$4200	1344	67,200	71,400
Machine Operation	13	11	85	2.20	88.00	$4400	968.00	48,400	57,200
Electro-Mechanical Inspection	6	6	100	2.13	85.20	$4260	511.20	25,560	25,560
Diversified Work Experience	18	18	100	1.95	78.00	$3900	1404	70,200	70,200
TOTALS								432,020	528,680
*AVERAGES	134	109	81	1.98	79.20	$3960	8632.8	431,640	530,640

(Table Two)

Vocational Education Process offerings totaled $432,020. It should be noted that these students responsible for generating this figure represent only one-half of all Vocational Education graduates, and only a percentage--approximately 81%--of those who were available for employment. Had all students who had been available chosen to become employed in their areas of training, then the hypothetical return to Danbury in terms of earning power would have been $528,680.

Compared to the total input amount of $348,028, $432,020 represents an increase of approximately 24%. In fact, the amount presumed to have been earned by these students after having graduated actually surpassed the total of the 1970-1971 allocation of $400,232.

Was Danbury expending an exorbitant amount per Vocational Process student to produce such a return? According to the computations performed to arrive at a per pupil cost--No. The National Educational Finance Project has determined ratio costs for exemplary programs in schools.[23] Their determinations of relative weight are presented below--

Educational Program	Weight Assigned
Basic elementary grades 1-6	1.00
Grades 7-9	1.20
Grades 10-12	1.40
Kindergarten	1.30
Mentally handicapped	1.90
Physically handicapped	3.25
Special learning disorder	2.40
Compensatory education	2.00
Vocational-technical	1.80

Assuming that Danbury offers all of these programs, but that a per pupil expenditure figure for the district would approximate an average rather than a basic cost, the following computations were

allowed: If one averages only k-12 relative weights, one arrives at a ratio of 1.2. Assuming this to be representative of the per pupil expenditure, which is also an average, then a basic, or 1.0, expenditure per pupil may be found by dividing the average per pupil expenditure by 1.2. In 1969-70, Danbury spent $789.08 per pupil.[24] Taking this figure as representing a relative weight of 1.2, the basic cost per pupil, 1.0 or Grades 1-6, would amount to $657.57. By using this figure, and the Vocational Education allocation for the same year, the Cost of Educating a Vocational Education Student, 1969-1970 and 1970-1971 was computed and relative weights assigned. These computations, which appear on pages 19-21, are explicit, but a few of the more salient findings might here be noted:

*The Vocational Education Process in 1969-1970 cost 1.32 times the amount required to educate a high school student in the regular program and 1.85 times the amount required to educate students in grades 1-6.

*The Vocational Education Process in 1970-71 cost 1.26 times the amount required to educate a high school student in the regular program and 1.76 times the amount required to educate students in grades 1-6. ALTHOUGH IT IS NOTED IN THE COMPUTATIONAL EXERCISES, PAGES 19-21, THAT MORE DATA WOULD BE REQUIRED TO DETERMINE A TREND, THE EVIDENCE ACCORDING TO THE COMPUTATIONS WOULD SEEM TO BE IN FAVOR OF THE FINDING THAT THE COSTS OF VOCATIONAL EDUCATION WERE ACTUALLY DECLINING RELATIVE TO REGULAR SCHOOL COSTS.

*The Vocational Education Process costs for the Danbury Public School System are comparable to the relative weights for such programs as assigned by members of the National Educational Finance Project.

In summary, it has been contended that a cost-benefit analysis of Vocational Education was possible, given access to data concerning the Danbury Public School System, 1969-1970. Such analysis

(continued on p. 22)

Cost of Educating A Vocational Education Student
Danbury Public School System
1969-1970

1. Since 227 represents approximately 45% of those students enrolled in the Vocational Education Program, the total allocation for the school year 1969-70 was for the servicing of 504 students. So--

   Allocation per pupil=Total allocation/504

   $\frac{348,028}{504} = \$690.53$

2. The cost of educating a high school pupil in the regular school program might be computed as follows:

   a. The k-12 cost of educating pupils in 1969-70 = $789.08

   b. Averaging the ratios according to National Education Finance Project figures (see text for explanation), it is assumed that $789.08 represents 1.2 times the basic expenditure per pupil. Consequently, the basic expenditure per pupil is computed:

      $789.08 divided by 1.2 = $657.57

   c. The high school cost per pupil is taken to be 1.4 times the basic per pupil expenditure. So--

      $657.57 multiplied by 1.4 = $920.60

3. Based on 2c above, the cost per class is assumed to be $920.60 divided by 7. $920.60 divided by 7 = $131.51. Since Vocational Education Program students, although admittedly assigned formally to two periods of vocational involvement per day, typically are also involved in one or two additional vocational education periods. Consequently, the regular program has been defined as having a value of four periods for the majority of vocational education students. The regular program cost for these students then, would be four times $131.51, or $526.04.

4. The total cost for a vocational education student would be that cost granted by vocational education allocations (#1 above) and the cost of regular program involvement. So--

   $690.53 plus $526.04 = $1216.57

5. Ratio of Vocational expenditures to regular program expenditures:

   (Computational Exercise--One)

Cost of Vocational Education, 1969-70 (continued)--

$$\frac{\text{Vocational Education expenditures}}{\text{High School Regular Program expenditures}} = \frac{\$1216.77}{\$920.60} \text{ or } 1.32$$

6. Ratio of Vocational expenditures to basic program expenditures:

$$\frac{\text{Vocational Education expenditures}}{\text{Regular Program expenditures}} = \frac{\$1216.77}{\$657.57} \text{ or } 1.85^{*}$$

*It is cited that exemplary vocational education programs typically cost between 1.8 and 1.9 times the amount of regular programs. As can be readily observed, this is true in Danbury's case. However, the next school year, 1970-71, showed a decrease in this cost ratio. Although more data would be required to determine a definite trend, it is assumed that without rapid expansion of program, vocational expenditures, or costs, would be expected to decrease as a function of Danbury's basic per pupil allocation over time. Examination of 1970-71 data lends support to this assumption.

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Cost of Educating
A Vocational Education Student
Danbury Public School System
1970-1971

Following the same logic as above:

1. Total enrollment in Vocational Education program--547

   Allocation per pupil = Total allocation ($400,232)/547 = $731.69

2. Cost of educating pupil in regular school program

   a. The k-12 cost, 1970-71 = $911.59

   b. Basic cost:

      $911.59 divided by 1.2 = $759.66

   c. High school cost per pupil:

      $759.66 multiplied by 1.4 = $ 1063.52

3. Cost per class = $1063.52 divided by 7, or $151.93; regular program cost for vocational students:

   $151.93 multiplied by 4, or $607.72

4. Total cost per vocational education student

   $731.69 plus $607.72 = $1339.41

(Computational Exercise--One, continued)
and
(Computational Exercise--Two)

Cost of Vocational Education, 1970-71 (continued)--

5. Ratio of Vocational expenditures to regular program expenditures:

$$\frac{\text{Vocational Education expenditures}}{\text{H.S. Regular Program expenditures}} = \frac{\$1339.41}{\$1063.52} \text{ or } 1.26$$

6. Ratio of Vocational expenditures to basic program expenditures:

$$\frac{\text{Vocational Education expenditures}}{\text{Regular Program expenditures}} = \frac{\$1339.41}{\$759.66} \text{ or } 1.76 \text{ (down from 1.85 for 1969-70)}$$

has revealed that there was a return of $432,020 earned by those students who became employed in an area related to their area of vocational training during the year 1969-1970. This amount of return represents 124% of the input monies allocated for Vocational Education in Danbury High School during the same year. In addition, it represents the earnings of less than half the Vocational Education graduates for that year. As a hypothetical return, had all students available for employment actually worked in the area for which they were trained, the City of Danbury could plausibly have expected $528,680. This total, still, would have represented the earnings of only slightly over half of the Vocational Education graduates for the school year 1969-1970.

The cost of Vocational Education in Danbury was found to have decreased between the years 1969-1970 and 1970-1971, relative to the costs of educating students in the regular school program; further, the costs of Vocational Education in Danbury are held to be in accordance with authoritative opinion. And finally, the Optner Model for systems-analysis has shown itself to be a powerful analytical tool.

Conclusion

The concept of Vocational Education has been fraught with difficulties for years. The basic philosophical argument pertaining to the quest for educational-equality or educational-excellence looms large as a consideration in the minds of those who must decide upon

allocations for differential educational programs. The basic notion of academic pursuit, to the exclusion of the practical, as primary educational purpose, seems to have diminished in recent years. But one is forced to realize that such a change came about, not as the vision of educators, but as the result of reaction to various dysfunctional societal symptoms. Were Vocational Education more indigenous to the thinking of those who positionally control the educational process, perhaps the negative connotations attached to the phrase might be erased. Further, any stigma attached to those students undergoing the Vocational Education Process might forever be eradicated. The President of Marketing Communications, Inc., has voiced his thoughts regarding the dilemma most articulately:

> It happens that I am intensely interested in the thesis underlying the work of [The Vocational Education Department]. In my view, the edict that everyone must go to college, presumably under the banner of egalitarianism, promotes two major pejorative consequences: (1) Such mass "education" must be geared to the lowest common denominators, resulting in no one being educated to the capability-levels of the institution and faculty, and (2) The intellectually and/or physiologically unqualified are foisted onto society incapable of coping successfully with their economic environment. Little wonder that a vociferous minority of our youth cries out against "the system" and insist on revolutionary change. Can there be anything more demeaning to the human spirit than seeming impotence in affecting one's destiny?[25]

Dr. Sidney Marland, the U.S. Commissioner of Education, has forthrightly declared the priority level for Vocational Education: "Opportunities for vocational or 'career' education must be increased...because the nation no longer has a place for a person who is not going to college and doesn't possess a salable

skill."[26] Perhaps Vocational or Career Education may aid in the resolution of the question of excellence or equality by providing all students with the opportunity to excel in any area of chosen pursuit--the practical as well as the academic--the quest for "self" as well as the quest for the societally sanctioned.

Footnotes

[1]Albert E. Jochen and C. Thomas Olivo, Educated Manpower... Hope of the Present: Promise of the Future! (Danbury, Connecticut: The Danbury Board of Education and the Connecticut State Department of Education, April, 1965), p. 70.

[2]Ibid., pp. 96-98.

[3]Ibid., p. 117.

[4]Ibid., pp. 117-118.

[5]Ibid., pp. 112-137.

[6]Ibid., p. 127.

[7]Vocational Education Act of 1963 (Public Law 88-210, 88th Congress), Sec. 2, as cited in Roy W. Roberts, Vocational and Practical Arts Education, second edition (New York: Harper and Row, Inc., 1965), p. 571.

[8]Ibid., Sec. I.

[9]Jerry M. Rosenberg (ed.), New Conceptions of Vocational and Technical Education (New York: Teachers College Press, Teachers College, Columbia University, 1965), pp. 1-2.

[10]Ibid., p. 49, as cited in Charles R. DeCarlo, "Work and Vocational Education," pp. 45-57.

[11]Ibid.

[12]Roberts, Vocational and Practical Arts Education, p. 577. (emphasis added)

[13]Professor Guilbert Hentschke, Lecture (Teachers College, Columbia University, April 10, 1972).

[14]Ibid.

[15]The Productive School: A Systems Analysis Approach to Educational Administration (New York: John Wiley and Sons, Inc., 1971), pp. 82, 87, 88, 113.

[16]Ibid., p. 82, citing Thomas A. Goldman (ed.), Cost-Effectiveness Analysis (New York: Praeger, 1967), p. 18.

[17]Ibid., citing private memorandum from Mary Jean Bowman.

[18]Ibid., p. 87.

[19]Ibid., p. 88.

[20]See Ralph Kimbrough, Administering Elementary Schools (New York: The Macmillan Company, 1968), p. 36; see also--Optner, Stanford. Systems Analysis for Business Management. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1960.

[21]Connecticut State Department of Education, Division of Vocational Education, Graduate Follow Up: Statistical Data on Connecticut Students Completing Vocational Programs in 1970 (Hartford, Connecticut: The Department, n.d.).

[22]New York Times (January 10, 1972), citing President's Commission on School Finance, 1971.

[23]Roe L. Johns and Kern Alexander, Future Directions for School Financing (Gainesville, Florida: National Educational Finance Project, 1971), p. 28.

[24]Private conversation with Danbury School District personnel; information available in various State publications.

[25]Private correspondence from G.S. Conigliano, President, Marketing Communications, Inc., Wayne, New Jersey (January 27, 1971).

[26]New York Times (August 8, 1971).

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